LabScrum Guide 1.0

Summer 2019

Lisa May, PhD

About LabScrum

LabScrum is a process framework developed to manage work in academic scientific research. LabScrum is an adaptation of the Scrum project management framework. Scrum was developed by Ken Schwaber and Jeff Sutherland for use in software development in the early 1990s. Lisa May developed LabScrum in 2017, in collaboration with Center for Translational Neuroscience research scientists and with advice and mentorship from Tamara Runyon, Certified Scrum Trainer (CST).

LabScrum is presented as a standalone framework that is distinct from Scrum in order to increase clarity and ease of adoption for research scientists. Some elements of Scrum translate very well for use in scientific research, but some aspects need a considerable amount of adaptation! This is only natural given how widely the constraints, needs, and goals of academic scientific research differ from those in corporate environments.

Can LabScrum work for you?

Any research group can find a way to implement LabScrum. A spirit of experimentation and people who are willing to fill key facilitate roles are all that are required. **LabScrum often results in significant time savings for PIs and is usually about neutral in time commitment for trainees.**

The LabScrum framework is designed to be *structured but flexible*. Each LabScrum element provides productivity, scientific rigor, knowledge sharing, and quality of life for the teams that use it, so an all-or-nothing approach is not required. Teams have had success using some, but not all, of the LabScrum practices.

We encourage teams to think creatively with a spirit of openness and experimentation about which set of LabScrum practices is a good fit for their mission and culture. Constructive dialogue about what practices could *provide value* for research and training is at the heart of LabScrum.

Focus conversations on:

- What are the team's priorities, needs, goals, and barriers?
- What can increase the team's productivity, quality of research/training, and quality of life?
- Do the elements of LabScrum inspire practices the team is willing to try?

The LabScrum Guide

Throughout this guide, portions of the Scrum Guide are quoted directly wherever possible to maintain fidelity to the original source material and to give credit to the creators of Scrum.

> Direct quotes from the Scrum Guide are indicated by a line in the left margin.

The LabScrum Guide focuses on "how to" implement LabScrum; it's intended to be instructive but not exhaustive. Additional resources such as case studies and video interviews are available at ctn.uoregon.edu/labscrum and labscrum.org.

Is Scrum an acronym? Nope!
It's a metaphor from rugby
about teamwork and collaboration.

Definition of Scrum

Scrum (n): A framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value.

Scrum is:

- Lightweight
- Simple to understand
- Difficult to master

Scrum is a process framework that has been used to manage work on complex products since the early 1990s. Scrum is not a process, technique, or definitive method. Rather, it is a framework within which you can employ various processes and techniques. Scrum makes clear the relative efficacy of your product management and work techniques so that you can continuously improve the product, the team, and the working environment.

Scrum Values

When the values of commitment, courage, focus, openness and respect are embodied and lived by the Scrum Team, the Scrum pillars of transparency, inspection, and adaptation come to life and build trust for everyone.

Successful use of Scrum depends on people becoming more proficient in living these five values.

For example, LabScrum helps researchers:

- *commit* to engage with one another in a collaborative, supportive way;
- have the *courage* to share their personal work barriers and radically shift how they approach their work;
- develop *focus in* a chaotic environment with competing priorities;
- create *openness* by sharing knowledge, practices, and vulnerabilities;
- show *respect* for one another by giving honest feedback in a nonjudgmental way and reducing wasted time.

Scrum Theory

Scrum is founded on empirical process control theory, or empiricism. Empiricism asserts that knowledge comes from experience *and* making decisions based on what is known. Scrum employs an iterative, incremental approach to optimize predictability and control risk.

Three pillars uphold every implementation of empirical process control: transparency, inspection, and adaptation. LabScrum's focus on empiricism is highly consistent with the scientific method. Research scientists are trained to think about empiricism and the scientific method in terms of work *product*, but often don't think empirically about work *process.* Creating work process visibility and utilizing a

framework for ongoing improvement can improve the quality of the science (more rigorous science), the quantity of the science (more productive science), and the quality of life for scientists (more sustainable science).

Transparency

Each facet of the research process must be observable to the team to uncover process improvements. Transparency also helps in identifying opportunities for training, problem-solving, and collaboration.

Examples of transparency include:

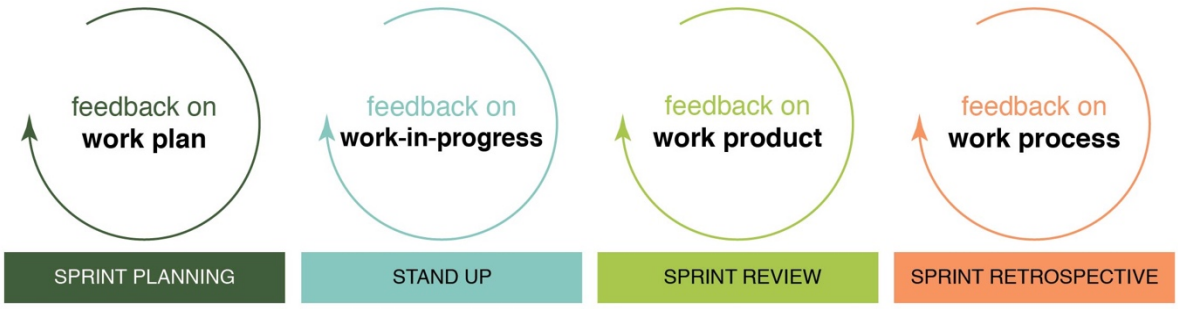
- regular, lab-wide communication about long-term project, training, and career goals;
- regular, lab-wide communication about work-in-progress;
- documentation that is accessible to everyone in the lab (e.g. lab wiki);
- a list of planned manuscripts from a big dataset, so that everyone can see opportunities for contribution and collaboration.

Inspection

Structured reflection supports deep thinking about processes and ideas for improving them. This type of dedicated reflection about the work process can otherwise fall to the bottom of the priority list amidst the other commitments held by researchers.

Adaptation

Direct experience is the only way to know whether a LabScrum practice adds value for a team. Transparency and inspection generate ideas for process improvements, and a spirit of experimentation drives ongoing adaptation. When trying out an idea, it's key to remember that the team is doing simply that—trying it out. Experiments yield experience that informs future adaptations. The goal is to never be "done", but instead to create a system for ongoing adaptation. LabScrum provides a framework for empiricism via four feedback loops.



Be open to experimentation. The goal is to find what works for your team.
Others can give advice, but your team is the ultimate authority on what constitutes "doing it right".
This will likely change over time.

LabScrum and the Scrum Master Role

In industry, Scrum uses several clearly defined roles, but most of these roles don't map directly onto academic research roles. However, there is a servant-leader and facilitator role called the Scrum Master that provides tremendous value in academic research.

What if you don't have a Scrum Master?

You are not alone. Some labs are able to fund a Scrum Master type position, but many are not. The PI may fulfill many of these functions as the natural leader of the lab, or a lab member may step up to this role for a certain amount of time. Organizing a rotating responsibility system (e.g. a sign-up sheet to take turns facilitating meetings) can work, too. With creativity and flexibility, the value of these functions can often be found even when a dedicated Scrum Master is not feasible.

Contributions of the Scrum Master Role

In all meetings, the Scrum Master helps the team:

- maintain constructive focus and not derail into uselessly negativity;
- maintain an appropriate level of detail and not derail into minutia or omitting important details;
- manage timeboxes to keep meetings within the allotted time;
- maintain focus on the goal(s) of the meeting and not derail into discussion of other work;
- maintain focus on process improvement goals and not allow product focus to overwhelm process focus;
- watch for barriers, encourage that they be addressed, and not accept the status quo of learned helplessness;
- watch for potential collaboration, training, or mentorship opportunities and not accept a tradition of siloed work.
- instigate and facilitate long- and short-term project planning, both one-on-one and in groups.

Outside of meetings, the Scrum Master helps the team move their science forward by being an engaged advocate, cheerleader, and sounding board who seeks team members out to hear how work is progressing and look for ways to help. Of course this kind of support is the most difficult to fund in the face of competing time demands; however, having someone dedicated to the success of the team's science in this way provides a level of cohesion and lab-wide vision for problem-solving that dramatically increases productivity and quality of life.

<u>Skills/Traits for this kind of work:</u>

- extraversion – enjoyment/tolerance of frequent dialogue;
- risk tolerance – willingness to ask questions and be wrong;
- interpersonal skills – ability to build positive relationships;
- scientific curiosity – genuine interest in lab members' work;
- servant leadership – commitment to success of lab members;
- scientific training – domain-specific knowledge is helpful, but general knowledge and experience of research processes are most important;
- distress tolerance – willingness to engage with systemic problems of academia.

Further contributions of the Scrum Master role are included in the discussion of each LabScrum meeting below.

LabScrum Meeting Structure

The Sprint

LabScrum provides a framework for approaching work in small, discrete units of time. A "Sprint" is enough time to get work done so that the team is ready to regroup, get feedback, and plan next steps. A Sprint contains one iteration of all the LabScrum meetings: Sprint Planning, Stand Ups, Sprint Review, and Sprint Retrospective.

LabScrum provides structure for managing all the work of the lab in a unified system. Lab members are often juggling several projects with diverse content and at various stages of development. For example, a lab may have large federally funded projects that are managed by lab staff, smaller projects managed by individual graduate students, and peer-to-peer collaborations across labs. The whole team uses the Sprint cycle together in sync.

Approaching work in Sprints:

- creates a structure and rhythm to encourage a predictable, safe, and sustainable work pace;
- helps introduce predictability that helps with strategic decision-making;
- builds habits of conversations about work plans, work-in-progress, work product, and work process.

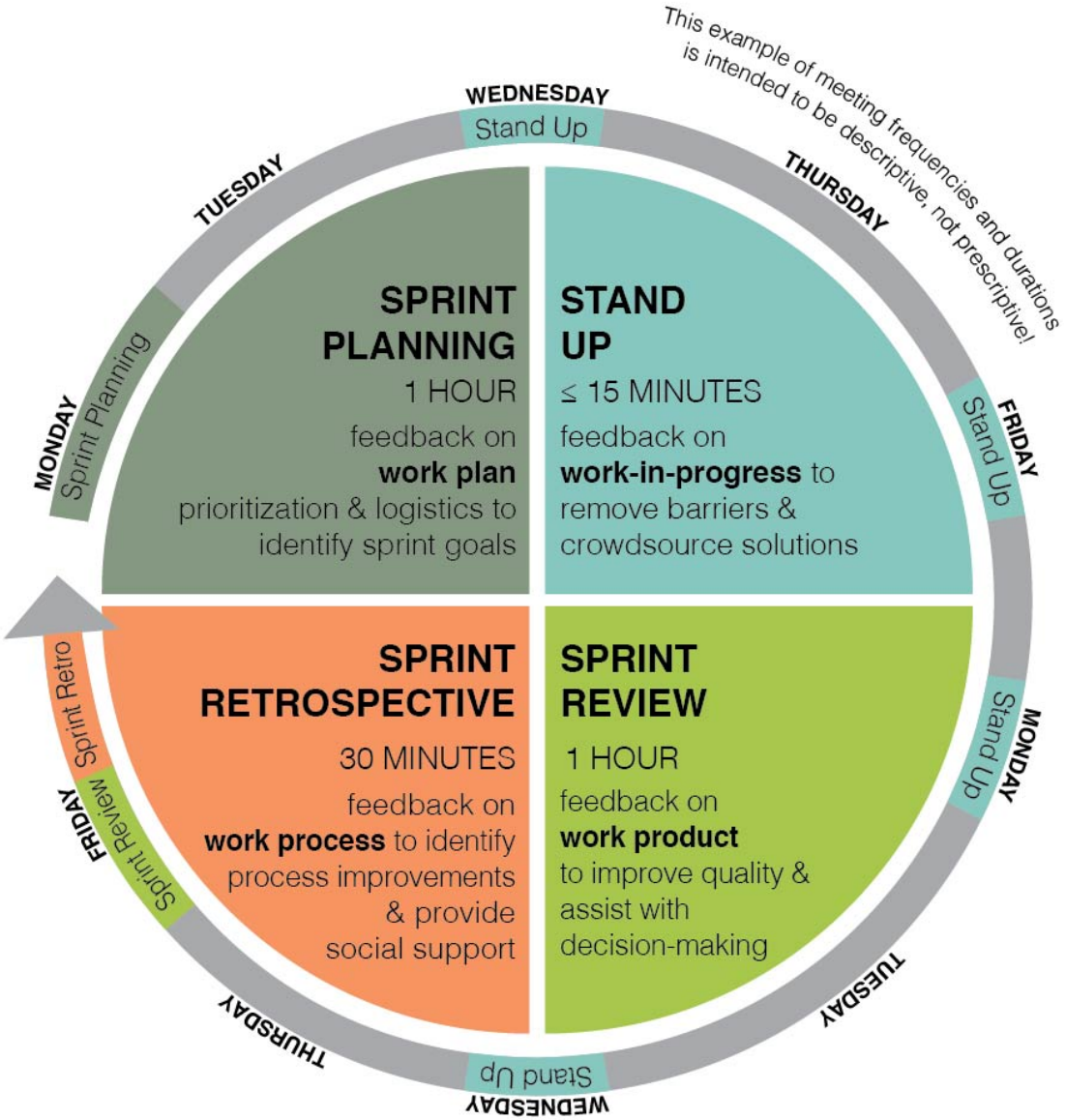
How long should your Sprint be?

The guiding question for determining Sprint length is "how much time do we need to get a good chunk of work done so that we're ready to regroup, get feedback on what we've accomplished, and plan our next steps?"

A Sprint length of one to two weeks works well for many teams. Two-week Sprints tend to work well for graduate students who are juggling other time commitments such as teaching or taking classes. One-week Sprints can be helpful when an individual is engaged in focused work to meet an impending deadline such as a dissertation or grant submission, or when a team is launching a large project such as an R01.

LabScrum Example Sprint Cycle

This example is based on a two-week Sprint and is not adjusted for weekends. After a short period of experimentation, each team finds a schedule that works for them. Meetings get shorter or longer depending on Sprint length.



Sprint Planning

Concrete, measurable Sprint goals for each team member are the key outcome of the planning meeting. Team members come into the meeting with a draft Sprint plan that is then adapted based on feedback about prioritization and logistics.

Most researchers have a large list of "to-do's for each Sprint. Sprint goals are not simply this list. Instead, Sprint goals articulate the key higher-level priorities for the Sprint that help guide decision making and time management during the Sprint about where to allocate time. For example, one person's Sprint

goals might be to 1) file an IRB renewal and 2) get manuscript revisions back to a collaborator. That person would likely finish plenty of other work in that time period, but the purpose of elevating those two goals to the status of Sprint goals reflects their priority over other goals and small "fires" that might arise during the Sprint.

What happens in Sprint Planning?

Team members come into the meeting with a draft Sprint plan. The agenda consists of each team member sharing their plan and then a short time of discussion about issues such as methodology:

- "How are you cleaning those data?"
- "Have you considered this alternate method?"

and prioritization:

- "It sounds like your plan is quite ambitious, especially given your family's visit next week. How could you structure your work to ensure that the highest priority elements of this feature get completed this Sprint?"

Then the meeting's focus turns to the next team member. The meeting's facilitator may need to actively manage time usage for this meeting in the beginning, but practiced teams often become quite efficient with this format. By the end of Sprint Planning, Sprint goals are displayed somewhere that is highly visible – either physically such as on a whiteboard in the lab, or electronically via a shared software system.

The Scrum Master role in Sprint Planning

in Sprint Planning, the Scrum Master helps the team ask probing questions to encourage dialogue about priorities and logistics. For example, "Do those of you who have used similar datasets think this timeline is feasible? Given the other commitments Pradeep is balancing, what do you think should be prioritized?"

Stand Up

The "Stand Up" is a short check-in meeting where each person reports on the status of their work. Team members gather in a circle and physically stand up. Standing in a circle can feel weird at first, but it is highly effective for keeping meetings brief and respecting everyone's time.

This method of standing in a circle looks like the "scrum" in rugby.
This meeting is officially called the "daily scrum" in traditional Scrum.

Three questions guide the Stand Up agenda:

1) What have you worked on since the last meeting?
2) What do you plan to work on next?
3) Are there any barriers in your way?

Team members are encouraged to focus on priority work by referring to the Sprint goals which are visible during this meeting (e.g. displayed on a monitor or visible on a whiteboard).

How is this *not* just reading off a to-do list?

The goal is to provide a venue for team feedback on work-in-progress by bringing problems to the team's attention and coordinating problem-solving. Although sometimes a solution is presented very

quickly, problems are not usually *solved* during a Stand Up. Instead, having everyone present allows for effective c*oordination* of problem-solving. For example, two team members may agree to meet to discuss a solution to a problem immediately after the Stand Up.

How frequent, and for how long?
Stand Up frequency is determined by the availability of the team. Many labs hold two or three Stand Ups a week and find that this frequency works well for them, while teams with full-time research staff may be able to hold Stand Ups daily. Teams have found that fewer Stand Ups with everyone in attendance are more useful than more Stand Ups with limited attendance. Since group problem-solving is the goal, Stand Ups lose their value when very many team members aren't able to attend.

The Scrum Master's role in Stand Ups
A time-box of 15 minutes or less forces prioritization and helps teams cultivate a habit of brevity. The Scrum Master attends carefully to time, can give encouraging feedback ("that only took us 8 minutes!") or help identify when problem-solving or socializing need to be moved outside Stand Up out of respect for team members' time.

The Scrum Master also helps the team coordinate scheduling and tasks that arise from Stand Up. For example, at the end of Stand Up, "two of you decided to meet to work out a solution to [problem x], and three of you wanted to set up a group writing session. Will you all take a minute to schedule these now? Also, Ljilja volunteered to e-mail Irene about [problem y] for Siegfried. Ljilja, will you make sure to do that?"

Sprint Review
Sprint Review (a.k.a. "demo") is the meeting that is most similar to a traditional lab meeting because of the focus on work product. A day or two before the end of the Sprint, lab members identify work that could benefit from review and an agenda is created. Not every Sprint goal produces work appropriate for review, so a lab might review and give feedback on one to three items during a ninety-minute meeting. For example, a completed IRB/IACUC application would likely not benefit from team review, but completed analyses would. Teams have found value in keeping presentations informal and "off-the-cuff" instead of creating formal presentations just for this meeting. Creating an agenda near the time of the meeting ensures that the agenda reflects work that is actually complete and ready for review.

The Scrum Master role in Sprint Review
The Scrum Master helps the team coordinate agenda creation before Sprint Review: "Hey, Christa, do you think you could share your recent work on [whatever]? I think several team members would be interested." "Deepak, how are you coming along with [whatever]? Could you benefit from some feedback?"

During the meeting, the Scrum Master helps the team by asking probing questions to encourage dialogue about the scientific content that's being presented. For example, "Harriet, what are your thoughts about what's being presented here? You have strong opinions about how this method is used, right? How could this be improved?"

Sprint Retrospective
Sprint Retrospective is a venue for teams to reflect on their work *process* in an effort to make it more

effective and enjoyable in the future. This is at the heart of the increases in quality and productivity that are often seen with LabScrum.

The purpose of the Sprint Retrospective is to:

- Inspect how the last Sprint went with regards to people, relationships, process, and tools;
- Identify and order the major items that went well and potential improvements; and,
- Create a plan for implementing improvements to the way the [team] does its work.

What does a Sprint Retrospective actually look like?

The format of Sprint Retrospectives varies greatly based on the needs of team and the Sprint goals. At times, some teams use Sprint Retrospectives to provide problem-solving and social support around aspects of work or personal life that impact work effectiveness and enjoyment. At other times, Sprint Retrospectives are focused strictly on research process improvements. In some labs, PIs attend Sprint Retrospectives only on occasion to facilitate confidential support among team members without the PI present.

Ideally, the format for the Sprint Retrospective is decided just a day or two before the meeting, based on as assessment of the needs of the team at that time. The process-level goal of the Retrospective facilitator is to create an environment where the team can reflect on their process during that Sprint to support quality of work and quality of life.

The Scrum Master role in Sprint Retrospective

The Scrum Master helps the team create an agenda before the meeting, based on an assessment of the needs of the team. The Scrum Master also facilitates the meeting to generate useful reflections and actionable process improvement goals.

Esther Derby and Diana Larsen describe a useful 5-step Sprint Retrospective structure in their book *Agile Retrospectives, Making Good Teams Great.* There are also many internet resources that can spark inspiration for Sprint Retrospective ideas.